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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/702,200	11/04/2003	Ryoji Kubo	1232-5191	7121

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EXAMINER	
CUTLER, ALBERT H	

ART UNIT	PAPER NUMBER
2622	

NOTIFICATION DATE	DELIVERY MODE
11/05/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/702,200	KUBO, RYOJI	
	Examiner	**Art Unit**	
	Albert H. Cutler	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 6, 2007 has been entered.

2. Claims 1 and 3-10 are pending in the application. Applicant has cancelled claims 2 and 11-15.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1, 3, 6, 8, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al.(US 6,963,374) in view of Anderson(US 6,847,388).

Consider claim 1, Nakamura et al. teach:

An image sensing apparatus("Digital Camera", figures 1-4, column 2, line 56 through column 4, line 43) comprising:

an image sensing device("CCD", 303, figure 4) which outputs image data obtained by an image sensing element(column 3, lines 50-58);

a white balance integration device("Black Level Correction/WB", 211a, figure 6a) which integrates the image data output from said image sensing device for white balance processing(column 5, lines 55-63);

an image processing device(211, figure 4) which performs a color space conversion processing for the image data obtained by said image sensing device(column 4, lines 8-10, lines 55-58);

a display device("EVF", 20, or "LCD", 10, figure 4) which displays an object image during imaging on the image sensing element(The display acts as a "live view display"(i.e. an object image is displayed during imaging), column 3, lines 16-23.); and

a control device("main CPU", 21, figure 4) which controls said white balance integration device(211a, column 5, lines 50-63), said image processing device(211, column 5, lines 50-66), and said display device(20, 10, column 5, line 66 through column 6, line 3), so that, said image processing device processes the color space conversion for second image data obtained by previous image sensing operation(See

"Pc", figure 8, column 7, lines 24-33, step S10, figure 7) in accordance with the start of the exposure/storage of first image data from the image sensing element(column 7, lines 24-33), the integral processing for the first image data(See "Pe", figure 8) by said white balance integration device(column 7, lines 41-49, step ST12, figure 7) and the color space conversion("Pc", figure 8) for second image data by said image processing device(211) processes are performed in series during read of the first image signal from the image sensing element(See figure 8, column 7, lines 24-49), and said display device("LCD", 10) displays the obiect image after the color space conversion("Pc") processing for the second image data ends(see figure 8) in case the integral processing for the first image data ends earlier than the color space conversion processing for the second image data ends(See figure 8. With regards to Nakamura et al., figure 8 shows that the color space conversion processing("Pc") of the second image data ends earlier than the integral processing of the first image data("Pe"), and makes no reference to the integral processing ending first. However, this point is discussed with respect to Anderson, see below.).

However, Nakamura et al. do not explicitly teach that said image processing device processes the color space conversion for second image data in accordance with the start of reading of the first image data from the image sensing element. Nakamura et al. do not explicitly teach that integral processing of the first image data and the color space conversion of the second image data are performed in <u>parallel</u>.

Anderson is similar to Nakamura et al. in that Anderson teaches of a camera(figures 1-3) with a memory(figure 4a). Anderson also similarly teaches of

reading out raw image data from an image sensor(114, figure 1, column 5, lines 59-64), storing the data in a memory(530, column 5, line 59 through column 6, line 3), and subsequently performing color space conversion on the image data(column 8, line 59 through column 9, line 7).

However, in addition to the teachings of Nakamura et al., Anderson teaches that the image processing device processes the color space conversion for second image data in accordance with the start of reading of the first image data from the image sensing element(See figure 4a, column 4, line 59 through column 6, line 3, column 6, lines 38-56, column 8, line 59 through column 9, line 8. Anderson teaches, "Referring again to FIG. 4B, the ping-pong buffers are utilized during live view mode as follows. While input buffer A is filled with image data, the data from input buffer B is processed and transmitted to frame buffer B. At the same time, previously processed data in frame buffer A is output to the LCD screen 402 for display. While input buffer B is filled with image data, the data from input buffer A is processed and transmitted to frame buffer A. At the same time, previously processed data in frame buffer B is output to the LCD screen 402 for display." As one buffer is filled with raw image data, the other buffer is emptied and processed, which processing involves color space conversion(See 612, figure 7, column 8, line 59 through column 9, line 8).).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use ping-pong buffers as taught by Anderson in the camera taught by Nakamura et al. to read out raw image data from the image sensor concurrent with the processing color space conversion of previous image data, for the

benefit of improving the display speed of the digital camera and preventing the tearing of the image on the display(Anderson, column 5, line 65 through column 6, line 3.).

Because the white balance integration taught by Nakamura et al. is performed during the raw data writing("Pe"), and thus in parallel with the readout of the first image data(see figure 8), the combination of Nakamura et al. and Anderson teaches that that integral processing of the first image data and the color space conversion of the second image data are performed in parallel.

Also, because ping-pong buffers are used in Anderson, and the color space conversion(see 612, figure 7) is performed concurrent with the readout/integral processing of the image sensor(see above), yet prior to display(see figure 7), the display device displays the obiect image after the color space conversion processing for the second image data ends(see figure 7, Anderson) regardless of whether the integral processing for the first image data ends earlier than the color space conversion processing for the second image data ends.

Consider claim 3, and as applied to claim 1 above, Nakamura et al. further teach:

the first image data includes image data having a signal amount corresponding to a color filter of the image sensing element(column 3, lines 50-58, the image signal is filtered into red, green, and blue image data),

and the second image data includes image data capable of confirming the object image(column 4, lines 11-19).

Consider claim 6, and as applied to claim 1 above, Nakamura et al. teach that a control device is used to control all functions of the camera(see claim 1 rationale) and that integral processing is performed on the image data after the display device displays the object image during imaging on the image sensing element(see claim 1 rationale).

However, Nakamura et al. do not explicitly teach the apparatus further comprises a thumbnail image generation device, which generates a thumbnail image on the basis of the first image data.

However, Anderson teaches that the apparatus further comprises a thumbnail image generation device which generates a thumbnail image on the basis of the first image data(See 606 and 616, figures 6 and 7, column 9, lines 9-15. Anderson teaches that the raw data used for live view display(i.e. first image data) is used to create a thumbnail image, due to the fact that the thumbnail image need not be a high resolution image.).

Anderson further teaches that said control device controls said thumbnail image generation device so as to generate the thumbnail image after causing said display device to display the object image during imaging on the image sensing element(column 9, lines 16-40).

Consider claim 8, and as applied to claim 1 above, Nakamura et al. further teach of a temporary storage device("DRAM", 232, and "Memory Card", 8, figure 4) which temporarily stores at least two first image data(DRAM(232) reads in raw data(first first image data) over channel 1, and reads out preceding image data(second first image

data) over channel 2, column 7, lines 15-49. Therefore, both first image data are stored in DRAM temporarily.) and one second image data(The memory card(8) stores second image data(i.e. processed image data), column 7, lines 34-38). The Ping-Pong buffers of Anderson(figure 4a) also work in this fashion.

Consider claim 9, and as applied to claim 1 above, Nakamura et al. further teach:

Said control device so controls as to start processing of said image processing device(211a) at any one of a timing at which a photographing instruction switch is released(See figure 7, in step ST1 a shutter release button(i.e. photographing instruction switch) is pressed, and this leads to step ST9 wherein white balance processing occurs. See column 6, line 57 through column 7, line 23).

Consider claim 10, and as applied to claim 1 above, Nakamura et al. further teach:

When display operation of said display device stops("live view display is not produced", column 7, lines 18-19), said control device so controls as to start processing of said image processing device(211a) at any timing at which a photographing instruction switch is released(See figure 7, in step ST1 a shutter release button(i.e. photographing instruction switch) is pressed, and this leads to step ST9 wherein white balance processing occurs. A live view display is not produced during step ST9. See column 6, line 57 through column 7, line 23).

6. Claims 4, 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. in view of Anderson as applied to claim 1 above, and further in view of Kagle et al.(US Patent 6,967,680).

Consider claim 4, and as applied to claim 1 above, Nakamura et al. teach of a control device that causes integral processing of first image data after causing a display device to display the object image during imaging on the image sensing element(see claim 1 rationale).

However, the combination of Nakamura et al. and Anderson does not explicitly teach that the apparatus further comprises a defect correction device which corrects a defective pixel portion of image data when the image sensing element has a defective pixel, and said control device controls said defect correction device so as to correct a defective pixel portion of the first image data during the integral processing.

Kagle et al. is similar to Nakamura et al. in image data is collected from the image sensor, preliminary processing is performed to yield first image data, second image data is obtained through post processing, and the final image is stored in memory(see figure 2, column 3, line 4 through column 4, line 12). Kagle et al. is also similar to Nakamura et al. in that white balance processing is performed during pre-processing(column 3, lines 18-23, figure 3).

However, in addition to the combined teachings of Nakamura et al. and Anderson, Kagle et al. teach that the apparatus further comprises a defect correction device(428, figure 3) which corrects a defective pixel portion of image data when the

image sensing element has a defective pixel(column 3, lines 31-37), and said defect correction device(428) corrects a defective pixel portion of the first image data during the integral processing(See column 3, lines 31-33, defective pixel processing is performed during pre-capture process control(i.e. integral processing), step 304, figure 2.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have a defect correction device for correcting defective pixels as taught by Kagle et al. in the integral image processing on the first image data within the camera device taught by the combination of Nakamura et al. and Anderson for the benefit that the defect correction device could determine malfunctioning pixels(column 3, lines 35-37) and thereby modify the performance characteristics of the camera in order to correct for defective pixels in advance, thus minimizing any processing delays that are undesirable when taking photographs in rapid succession(Kagle et al., column 1, lines 20-47).

Consider claim 5, and as applied to claim 1 above, Nakamura et al. teach of a control device that causes integral processing of first image data after causing a display device to display the object image during imaging on the image sensing element(see claim 1 rationale). Nakamura et al. also teach of performing white balance processing after causing said display device to display the object image during imaging on the image sensing element(see claim 1 rationale), and that white balance processing is

performed on the basis of an integral result of said white balance integration device(column 7, lines 15-19).

However, the combination of Nakamura et al. and Anderson do not explicitly teach that the apparatus further comprises a defect correction device which corrects a defective pixel portion of the first image data when the image sensing element has a defective pixel, or that a white balance coefficient calculation device calculates a white balance coefficient during integral processing to be used to perform white balance image processing.

Kagle et al. is similar to Nakamura et al. in image data is collected from the image sensor, preliminary processing is performed to yield first image data, second image data is obtained through post processing, and the final image is stored in memory(see figure 2, column 3, line 4 through column 4, line 12). Kagle et al. is also similar to Nakamura et al. in that white balance processing is performed during pre-processing(column 3, lines 18-23, figure 3).

However, in addition to the teachings of Nakamura et al. and Anderson, Kagle et al. teach that the apparatus further comprises a defect correction device(428, figure 3) which corrects a defective pixel portion of image data when the image sensing element has a defective pixel(column 3, lines 31-37), and said defect correction device(428) corrects a defective pixel portion of the first image data during the integral processing(See column 3, lines 31-33, defective pixel processing is performed during pre-capture process control(i.e. integral processing), step 304, figure 2.). Kagle et al. also teach that a white balance coefficient calculation device(404, figure 3) calculates a

white balance coefficient(After white balance process control is completed, a processing value(i.e. white balance coefficient) is returned to the pre-capture process control, column 3, lines 18-27.) during integral processing to be used as a basis to perform white balance image processing(The processing results of a first frame of image data obtained during pre-processing(i.e. integral processing) are used to process the second frame of image data as long as the results are within a threshold. See figure 6, column 5, lines 23-44).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have a defect correction device for correcting defective pixels, and a white balance coefficient calculation device as taught by Kagle et al. in the integral image processing on the first image data within the camera device taught by the combination of Nakamura et al. and Anderson for the benefit that the defect correction device could determine malfunctioning pixels(column 3, lines 35-37), and the white balance coefficient calculation device could produce values which could be applied to later image frames, thereby enabling the camera to modify the performance characteristics in order to correct for defective pixels in advance, and skip the step of determining a white balance coefficient when unnecessary, thus minimizing any processing delays that are undesirable when taking photographs in rapid succession(Kagle et al., column 1, lines 20-47).

Consider claim 7, and as applied to claim 1 above, Nakamura et al. teach of a control device and a display device(see claim 1 rationale).

However, the combination of Nakamura et al. and Anderson does not explicitly teach that the apparatus further comprises a defect correction device which corrects a defective pixel portion of image data when the image sensing element has a defective pixel, and said control device controls said defect correction device so as to correct a defective pixel portion of the first image data before causing said image processing device to start the image processing after causing said display device to display the object image.

Kagle et al. is similar to Nakamura et al. in image data is collected from the image sensor, preliminary processing is performed to yield first image data, second image data is obtained through post processing, and the final image is stored in memory(see figure 2, column 3, line 4 through column 4, line 12). Kagle et al. is also similar to Nakamura et al. in that white balance processing is performed during pre-processing(column 3, lines 18-23, figure 3).

However, in addition to the combined teachings of Nakamura et al. and Anderson, Kagle et al. teach that the apparatus further comprises a defect correction device(428, figure 3) which corrects a defective pixel portion of image data when the image sensing element has a defective pixel(column 3, lines 31-37), and said defect correction device(428) corrects a defective pixel portion of the first image data during the integral processing(See column 3, lines 31-33, defective pixel processing is performed during pre-capture process control(i.e. integral processing, before the start of image processing), step 304, figure 2.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have a defect correction device for correcting defective pixels as taught by Kagle et al. in the integral image processing on the first image data within the camera device taught by the combination of Nakamura et al. and Anderson for the benefit that the defect correction device could determine malfunctioning pixels(column 3, lines 35-37) and thereby modify the performance characteristics of the camera in order to correct for defective pixels in advance, thus minimizing any processing delays that are undesirable when taking photographs in rapid succession(Kagle et al., column 1, lines 20-47).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert H. Cutler whose telephone number is (571)-270-1460. The examiner can normally be reached on Mon-Fri (7:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (571)-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC

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SUPERVISORY PATENT EXAMINER